

# Successful Conviction of Intoxicated Drivers at a Level I Trauma Center

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**Introduction:** Conviction rates for drivers driving under the influence (DUI) and in motor vehicle collisions (MVC) presenting to trauma centers are based primarily on data from the 1990s. Our goal was to identify DUI conviction rates of intoxicated drivers in MVCs presenting to a trauma center and to identify factors associated with the failure to obtain a DUI conviction.

**Methods:** Retrospective study of adults (>18 years) presenting to a trauma center emergency department (ED) in 2007. Eligible subjects were drivers involved in a MVC with an ED blood alcohol level (BAL)  $\geq 80$ mg/dL. Subjects were matched to their Department of Motor Vehicle (DMV) records to identify DUI convictions from the collision, the legal blood alcohol concentration (BAC), and arresting officer's impression of the driver's sobriety. We entered potential variables predictive of failure to obtain a DUI conviction into a regression model.

**Results:** The 241 included subjects had a mean age of  $34.1 \pm 12.8$  years, and 185 (77%) were male. Successful DUI convictions occurred in 142/241 (58.9%, 95% CI 52.4, 65.2%) subjects. In a regression model, Injury Severity Score > 15 (odds ratio = 2.70 (95% CI 1.06, 6.85)) and a lower ED BAL from 80 to 200mg/dL (odds ratio = 5.03 (95% CI 1.69, 14.9)) were independently associated with a failure to obtain a DUI conviction.

**Conclusion:** Slightly more than half of drivers who present to an ED after a MVC receive a DUI conviction. The most severely injured subjects and those with lower BALs are least likely to be convicted of a DUI. [West J Emerg Med. 2014;15(4):480–485.]

## INTRODUCTION

Driving while under the influence (DUI) is illegal in all 50 states in the United States. Although DUI-related deaths have decreased, it remains a significant cause of preventable morbidity and mortality.<sup>1</sup> Thus, various efforts to further decrease the negative impacts resulting from intoxicated drivers continue.<sup>2,3</sup>

Evidence primarily from the 1990s indicated that a substantial proportion of intoxicated drivers involved in motor vehicle collisions (MVC) and transported to emergency

departments (ED) were not successfully prosecuted.<sup>4-15</sup> In these 12 studies DUI charges ranged from 3 – 41%, and convictions among those charged ranged from 0 – 63%. Remarkably, 8 studies reported DUI conviction rates < 20%.<sup>7,9-11,14,15</sup> A prior study demonstrated a DUI conviction rate of only 4% for those hospitalized after a MVC, while statewide the DUI conviction rate was 85% of non-injured drivers cited for DUI during the same time period.<sup>10</sup> A Canadian study including data from 1995 to 2003 suggests a conviction rate of only 15% for injured, impaired drivers.<sup>16</sup> Thus, failure to

obtain a DUI conviction in hospitalized patients appears to primarily be an issue of law enforcement failing to provide a DUI citation. These studies clearly demonstrated the need for increased diligence among law enforcement and medical providers in identifying and prosecuting intoxicated drivers presenting to EDs after MVCs.

Prosecuting DUI offenders decreases the risk of future alcohol-related MVCs.<sup>2,17,18</sup> More specifically, ED patients presenting after MVCs while driving intoxicated are at risk for future DUIs.<sup>7</sup> Therefore, increasing the number of prosecutions of intoxicated drivers who were evaluated and treated in the ED potentially decreases future DUI-related morbidity and mortality.

Despite multiple prior studies identifying poor DUI conviction rates and a call to increase prosecution of intoxicated, injured drivers treated in EDs, no recent evidence exists that suggests successful prosecution rates have increased. It is unclear if the identification of this problem and the subsequent awareness to close this gap has resulted in increased rates of DUI prosecution in ED patients who were drivers in MVCs. The goals of this study are to identify more recent DUI conviction rates of intoxicated drivers in MVCs presenting to the ED for medical care and to identify factors associated with the failure to obtain a DUI conviction in these patients.

## METHODS

### Study Design

This was a retrospective study of adult subjects (>18 years of age) who presented to the study site ED from January 1, 2007 through December 31, 2007. The study was approved by the study site's institutional review board.

### Setting

We conducted the study at an urban, university based, Level I trauma center. The hospital cares for more than 3,000 adult trauma admissions per year and provides Level I trauma services for a region of 6 million people covering 65,000 square miles.

### Selection of Participants

Subject eligibility included those drivers over the age of 18 involved in MVCs and presenting to the participating ED for care and undergoing a trauma activation (appendix). Study period was January 1, 2007 – December 31, 2007. Subjects were considered drivers if coded as such by the treating physicians, either based on subject report or emergency medical services records. Blood alcohol levels (BAL) are obtained as part of the standard ED evaluation of trauma team-activated subjects. We included all eligible subjects with an initial ED BAL  $\geq 80\text{mg/dL}$  in the study. Subjects were excluded if they died during their ED evaluation or subsequent hospitalization. We also excluded subjects if no BAL was obtained in the ED.

## Data Collection and Processing

We reviewed the medical records to identify all drivers with BALs  $\geq 80\text{mg/dL}$ . Clinical data collected included age, gender, date of MVC, Glasgow Coma Scale (GCS) score, ED intubation, death, hospital admission, and Injury Severity Score (ISS). If any of these data were missing from the trauma registry, we reviewed the electronic health record to gather the missing data. All clinical data were collected without abstractor knowledge of the outcome of interest. Subjects were then matched to their Department of Motor Vehicle (DMV) records to identify any convictions associated with the MVCs for the subject's index visit. This linkage occurred without the DMV knowledge of any clinical variables beyond name, date of birth and date of MVC. This search occurred at least 2 years after the ED visit to ensure more than enough time for adjudication through the legal system.<sup>16</sup> In addition, we also collected from the DMV records the evidential blood alcohol concentration (BAC) for the DUI citation or conviction, if it was obtained, along with the investigating officers' impressions of sobriety.

## Outcome Measures

The outcome of interest was conviction for an intoxicated driving offense. This included convictions for any of the various state and federal DUI laws, most commonly, the following California Penal Code (PC) or Vehicle Code (VC) violation sections: PC § 191.5 (California gross vehicular manslaughter involving alcohol and/or drugs), PC § 192.3 or PC § 192.C3 (vehicular manslaughter with or without negligence involving alcohol and/or drugs), VC § 23103 as specified in VC § 23105.5 (California "Wet" or alcohol-involved reckless driving), VC § 23140 (youth driving with an alcohol concentration of 0.05% or more, by weight, of alcohol in his or her blood), VC § 23152 (driving under influence of alcohol, drugs, or both), and VC § 23153 (driving under influence of alcohol, drugs, or both causing bodily injury to another – a felony conviction). DUI convictions with a violation date associated with the date of ED visit following the MVC were considered successful alcohol-related prosecutions.

## Data Analysis

We described data with simple descriptive statistics. Continuous data are presented as the mean  $\pm$  one standard deviation. We created a multivariate logistic regression model to identify variables independently associated with no DUI conviction. Ten percent of charts were reviewed to confirm data quality. We measured data reliability using the kappa statistic. Finally, we performed a sensitivity analysis to assess the impact of subjects not identified in the DMV records. We conducted all statistical analysis with STATA for Windows, Rel. 10.0 2007 (STATA Corp College Station, TX, USA).

## RESULTS

We identified 285 eligible subjects as being drivers in

**Table 1.** Characteristics of study patients (n=241) involved in motor vehicle collisions and with elevated blood alcohol levels.

			(95% CI)
Mean age	34.2 ± 12.7		years
Male gender	185	77%	(71, 82%)
Initial Glasgow Coma Scale=15	179	74%	(68, 80%)
Hospital admission	133	55%	(49, 62%)
Emergency department intubation	26	12%	(8, 17%)
Injury severity score > 15	32	13%	(9, 18%)
Blood alcohol level 80-200 mg/dL	109	45%	(39, 52%)
Blood alcohol level 200-300 mg/dL	107	44%	(38, 51%)
Blood alcohol level >300 mg/dL	25	10%	(7, 15%)

MVCs and having an elevated BAL  $\geq 80$ mg/dL. We excluded 44 (15%) subjects from further analysis due to the absence of a DMV match. The 241 subjects making up the study cohort had a mean age of  $34.2 \pm 12.7$  years and 185 (77%) were male. The median ED BAL was 204 mg/dL (interquartile range 146, 258 mg/dL). Additional subject characteristics are in Table 1. During the study period (2007), the successful prosecution of drivers receiving a DUI-related citation in California was 79%.

Successful DUI-related convictions occurred in 142/241 (58.9%, 95% CI 52.4, 65.2%) study subjects. In these 142 subjects, the mean ED BAL (223mg/dL, range 80 – 490 mg/dL) was significantly higher than the law enforcement-obtained evidentiary blood alcohol concentration (BAC) levels (171mg/dL, range 40 – 360 mg/dL), difference in means 52mg/dL (95% CI 47, 57mg/dL),  $p < 0.0001$ . In only 7 (5%, 95% CI 2, 10%) cases were subjects' ED BAL lower than the legal evidentiary BAC level. The ED BAL was more likely to be greater than 50mg/dL higher than the law enforcement BAC in those patients with an ISS > 15 (10/12, 83%, 95% CI 52, 98%) than those with an ISS < 15 (68/130, 52%, 95% CI 43, 61%).

The results of the multiple logistic model are presented in Table 2. The Hosmer-Lemeshow test demonstrated good fit of the model ( $p=0.87$ ). Both ISS and lower ED blood alcohol levels were associated with failure to obtain a DUI conviction.

Investigating officer's sobriety impression was available for 205 (85%) subjects. In these 205 subjects with an ED BAL >80mg/dL, the arresting officer's impression as indicated on the DMV driver record was "Had-been-drinking (HBD) - ability impaired" 165 (80%, 95% CI 74, 86%), "HBD – ability not impaired" 8 (3.9%, 95% CI 1.7, 7.5%), "HBD- unknown impairment" 9 (4.4%, 95% CI 2.0, 8.1%), and "had-not-been-drinking" 23 (11%, 95% CI 7.2, 16%). Despite having a median ED BAL = 135mg/dL (interquartile range 115, 217mg/dL), none of the 23 subjects considered as "had-not-been-drinking" by the investigating officer received a DUI conviction. Seventeen (74%)

**Table 2.** Multivariate regression model to predict failure to obtain a driving under the influence conviction.

	Odds Ratio (95% CI)	p-value
Age	1.01 (0.99, 1.03)	0.31
Male gender	0.78 (0.41, 1.48)	0.44
Emergency department blood alcohol level 80-200	5.03 (1.69, 14.9)	0.004
Emergency department blood alcohol level 200-300	1.93 (0.64, 5.82)	0.24
Hospital admission	1.27 (0.71, 2.30)	0.42
Injury severity score > 15	2.70 (1.06, 6.85)	0.048

of these had ED BALs < 200mg/dL. Only three (13%) of these 23 subjects were intubated, and 20 (87%) had GCS scores  $\geq 14$ .

Forty-four (15%) subjects were unable to be matched to DMV records. The mean age of these subjects was  $30.8 \pm 12.5$  years and 34 (85%) were male. Twelve (27%) were admitted and only two (5%) had an ISS > 15. We performed a sensitivity analysis, considering these patients to not be successfully prosecuted. Under this assumption, successful DUI-related convictions would have occurred in 142/285 (49.8%, 95% CI 43.9, 55.8%).

## DISCUSSION

DUI remains a problem despite considerable effort to prevent these incidents. This study demonstrates a substantial increase in the successful prosecution of intoxicated drivers involved in MVCs and cared for in an ED from prior published data. The protection from DUI prosecution offered by ED care, however, still exists, and despite the increase from the abysmal rates in the 1990s considerable room for improvement still exists.

We suggest that a goal for successful prosecution rates of intoxicated drivers evaluated in the ED mirror successful DUI prosecution rates of those given citations within the state. In this study the convictions rate was 59%, far lower than the state conviction rate of 79% of those cited during the same time period.<sup>19</sup> We evaluated several variables for their independent association with failure to obtain a DUI prosecution. Determining such variables allows for identification of those cases most likely to not be successfully prosecuted and to develop strategies aimed at increasing prosecution rates in these subjects.

The most severely injured subjects (ISS >15) were less likely to obtain a DUI conviction. This is not surprising as the most injured patients require numerous diagnostic tests and procedures. These activities often remove patients from the ED and delay or prevent police access. Prior evidence supports the failure to obtain conviction rates in the most injured patients.<sup>13,15</sup> Sympathy for the significantly injured driver has also been conjectured as an explanation for low prosecution rates. This reason may have influenced law enforcement 20 years ago; however, in the current environment, it likely plays a very minimal role.<sup>7</sup>

We also identified subjects with lower ED BALs as being less likely to receive a DUI or DUI-related conviction. This likely reflects those subjects appearing least intoxicated or who were evaluated by the officer such a significant time after the MVC that the subject had metabolized a substantial portion of their BAL. Officer evaluation of subject drinking included 11% documented as “had not been drinking” and 4% as “HBD - not impaired.” Prior work has also confirmed lower BALs and officer impression of subject drinking being associated with not receiving a DUI conviction.<sup>12</sup>

Future work should focus on better identification by officers of this lower BAL patient population (BAL < 200mg/dL) as they are well above the BAL for impairment and are at greatest risk for not being successfully prosecuted. One solution would be mandatory reporting by the ED physician/nurse providing care. This issue has been previously suggested and eloquently argued.<sup>4,5,7,9,11,13</sup> Currently, substantial variation in mandatory reporting laws exists across the U.S. Perhaps most supportive of the concept of mandatory reporting of intoxicated drivers is a 1990 survey of 1,041 emergency physicians, of whom 78% supported the practice.<sup>20</sup> A 2003 survey, however, suggested emergency physicians are more comfortable reporting intoxicated drivers to their state DMV rather than to law enforcement and more comfortable reporting those with higher BALs.<sup>21</sup> It must be noted, however, that in conflict with much of its membership, the American College of Emergency Physicians (ACEP) opposes both mandatory and permissive reporting. In a 2011 policy statement, ACEP “opposes legislation providing permissive or mandatory reporting of the results of patient toxicological screening, including but not limited to blood alcohol concentration levels, by physicians to law enforcement officials because such reporting fundamentally conflicts with the appropriate role of physicians in the physician-patient relationship.”<sup>22</sup>

The ED BALs were generally higher than the arrest BAC levels, which likely reflect the delay in the arresting officer

obtaining the evidentiary BAC level from the subject. In a normal traffic stop that results in a DUI citation, the officer is generally able to more quickly obtain an evidentiary alcohol level from either a breathalyzer reading or blood sample, which reflects the BAC closer to the time of driving. The ED BAL reflects the alcohol level at the time of ED blood draw (usually during initial ED evaluation). In cases where the subject is transported to the ED, the evidentiary alcohol level is drawn at the time the officer is able to evaluate the patient. This is often delayed by the medical care being provided and the time for the officer to get to the hospital from the MVC site. The more injured patients (ISS > 15) were most likely to have the greatest discrepancy between the ED BAL and the law enforcement BAC. Improved coordination between the ED staff and police officer may limit the delay in obtaining a legal BAC level.

Prior studies focused primarily on patients admitted to the hospital after presenting to an ED. This limitation introduces selection bias impacting the results and conclusions of these studies. Since the most injured patients are at lower risk to obtain a DUI conviction, prior studies likely underestimated the true rate of successful prosecution (patients with lesser injuries who were directly discharged home from the ED would not have been included in the study but likely were prosecuted at higher rates). The current study included all patients presenting to the ED following a trauma activation, and conviction rates in this study were highest in those discharged from the ED.

The current study has a higher conviction rate compared to all but one of the studies from the 1990s (Table 3). Several factors likely resulted in this increase. Certainly, there is more awareness by both law enforcement and healthcare providers. In addition, the study site has more supportive policies. During the study period, the study site had an official policy for registered nurses in the ED to draw blood for legal purposes if asked by the investigating officer. In addition, legal BAC kits were stored in the ED. Thus, we would

**Table 3.** Prior published studies on driving under the influence conviction rates in the United States.

Author	State	Time period*	Conviction for driving under the influence	95% confidence interval
Maull <sup>5</sup>	Tennessee	1979-82	0/53	0% (0, 5%)
Colquitt <sup>4</sup>	Connecticut	1981-85	0/53	0% (0, 5%)
Evett <sup>10</sup>	Virginia	1989-90	9/245	4% (2, 7%)
Barillo <sup>6</sup>	Pennsylvania	1990-91	205/511	40% (36, 44%)
Runge <sup>15</sup>	North Carolina	1990-91	32/187	17% (12, 23%)
McLaughlin <sup>13</sup>	Michigan	1990-91	29/49	59% (44, 73%)
Fantus <sup>11</sup>	Illinois	1991	0/61	0% (0, 5%)
Rehm <sup>14</sup>	New Jersey	1991	11/78	14% (7, 24%)
Krause <sup>12</sup>	Michigan	1991-97	35/69	51% (38, 63%)
Cydulka <sup>9</sup>	Ohio	1993-95	15/70	21% (13, 33%)
Biffi <sup>7</sup>	Rhode Island	1997-98	10/113	9% (4, 16%)
Chang <sup>8</sup>	Pennsylvania	1997-98	135/213	63% (57, 70%)

\*Time period is the time during which the patients presented to the emergency department.



consider the study site to be supportive towards officers and helpful in their DUI investigations. We would suggest EDs adopt a formal policy for their staff to assist officers in their investigation and obtaining an evidentiary BAC level. The study site, however, does not contact the police to inform them of the presence of an intoxicated driver.

## LIMITATIONS

The study has certain limitations. It is a retrospective analysis of the trauma registry for eligible patients. Some eligible patients may not have been identified if a BAL was not obtained in the ED. However, this is unlikely since the policy and practice at the study site, at the time, was to obtain BALs on these patients. Data are from 2007; it is possible that convictions rates have subsequently changed.

We were unable to match 15% of the original pool of study-eligible subjects with DMV driver license records either indicating that the subjects had no California driving record or provided a non-matchable, or false name or birth date. The rate of prosecution in these subjects is unknown but is likely lower than the rest of the subjects because they evaded detection or were more easily missed within the DUI adjudication process given their non-matching identifiers in the state system's records. Had none of these subjects been successfully prosecuted, the rate of successful prosecution would fall from 59% to 50%.

Finally, the study was performed at a single site that had a protocol to facilitate assistance for legal blood draws in the ED. The results may not be generalizable to all facilities, especially facilities that may not have such a commitment to assist law enforcement.

## CONCLUSION

Slightly more than half of drivers who present to an ED after a MVC receive a DUI conviction which is an increase from older evidence. The most severely injured subjects and those with lower BALs are least likely to be convicted of a DUI. The need for further improvement in prosecution rates of these subjects continues.

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